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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/835,374	04/17/2001	Tetsuya Nishi	1460.1020	5784

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EXAMINER	
WANG, GEORGE Y	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/835,374	NISHI ET AL.	
	Examiner	Art Unit	
	George Y. Wang	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Peri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. Applicant's request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 23, 2003 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-2 and 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission of Prior Art (AAPA) in view of Kashima (U.S. Patent No. 6,317,529) and Okuyama et al. (U.S. Patent No. 4,852,958, from hereinafter "Okuyama").

4. Regarding claims 1, 2, and 9-13, AAPA discloses an optical switch and optical switching method for increasing the number of inputs and outputs of an optical switch with four optical matrix switches where a plurality of 2-input/2-output optical switch elements are arranged in each matrix to form a plurality of inputs, outputs, and auxiliary input and output ports (fig. 13b).

However, AAPA fails to specifically disclose non-blocking optical matrix switches and the connection of the auxiliary output ports of the first optical matrix switch to the input ports of the third optical matrix switch, the connection of the output ports of the second optical matrix switch to the auxiliary input ports of the third optical matrix switch, the connection of the output ports of the first optical matrix switch to the auxiliary input ports of the fourth optical matrix switch, and the connection of the auxiliary output ports of the second optical matrix switch to the input ports of the fourth optical matrix switch.

Kashima discloses an optical cross-connect apparatus where switches are crossed for the expansion of input and output (fig. 1).

Okuyama discloses an optical cross-connect apparatus where switches are non-blocking (fig. 5a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have configured the connection of the auxiliary output ports of the first optical matrix switch to the input ports of the third optical matrix switch, the connection of the output ports of the second optical matrix switch to the auxiliary input ports of the third optical matrix switch, the connection of the output ports of the first optical matrix switch to the auxiliary input ports of the fourth optical matrix switch, and the connection of the auxiliary output ports of the second optical matrix switch to the input ports of the fourth optical matrix switch since one would be motivated to reduce signal loss (Kashima, col. 1, lines 66-67. In addition, one skilled in the art fully acknowledges that the essence of cross connecting switches is to increase the maximum number of possible combinations of switching elements, ultimately shortening the switching response time (Kashima, col. 1, lines 24-26) to expand the combination of inputs and outputs referenced in Kashima. Furthermore, by including non-blocking optical matrix switches, one could also produce a combination with hardly any crosstalk (Okuyama, col. 6, lines 38-55).

5. As per claim 5, AAPA discloses the optical switch as recited above with switches in an opto-micro-electromechanical system (fig. 13a, ref. 1002).

6. As per claim 6, AAPA discloses the optical switch as recited above. However, AAPA fails to specifically disclose optical switches that are PI-LOSS optical matrix switches.

Kashima discloses an optical cross-connect apparatus with optical switches that are PI-LOSS optical matrix switches (col. 1, lines 32-38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used PI-LOSS optical matrix switches since one would be motivated by its smaller size and basic switching function. Typically, one of ordinary skill in the art would use small-scale unit switches connected in series and stages for large-scale optical switches (col. 1, lines 32-38).

7. As to claim 7, AAPA discloses the optical switch as recited above. However, AAPA fails to specifically disclose non-blocking optical matrix switches and the connection of the auxiliary output ports of the first optical matrix switch to the input ports of the third optical matrix switch, the connection of the output ports of the second optical matrix switch to the auxiliary input ports of the third optical matrix switch, the connection of the output ports of the first optical matrix switch to the auxiliary input ports of the fourth optical matrix switch, and the connection of the auxiliary output ports of the second optical matrix switch to the input ports of the fourth optical matrix switch. Furthermore, AAPA fails to specifically teach a plurality of demultiplexing means for the input and a plurality of multiplexing means for the output.

Kashima discloses an optical cross-connect apparatus where switches are crossed for the expansion of input and output (fig. 1) and a plurality of demultiplexing means for the input and a plurality of multiplexing means for the output (abstract).

Okuyama discloses an optical cross-connect apparatus where switches are non-blocking (fig. 5a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have configured the connection of the auxiliary output ports of the first optical matrix switch to the input ports of the third optical matrix switch, the connection of the output ports of the second optical matrix switch to the auxiliary input ports of the third optical matrix switch, the connection of the output ports of the first optical matrix switch to the auxiliary input ports of the fourth optical matrix switch, and the connection of the auxiliary output ports of the second optical matrix switch to the input ports of the fourth optical matrix switch since one would be motivated to reduce signal loss (Kashima, col. 1, lines 66-67. In addition, one skilled in the art fully acknowledges that the essence of cross connecting switches is to increase the maximum number of possible combinations of switching elements, ultimately shortening the switching response time (Kashima, col. 1, lines 24-26) to expand the combination of inputs and outputs referenced in Kashima. Furthermore, by including non-blocking optical matrix switches, one could also produce a combination with hardly any crosstalk (Okuyama, col. 6, lines 38-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a plurality of demultiplexing means for the input

and a plurality of multiplexing means for the output since one would be motivated because the use of the switch is essential to its overall function in WDM systems for maximized capacity and speed for data transmission (col. 1, lines 10-14).

8. Regarding claim 8, AAPA discloses an optical cross-connecting apparatus with a plurality of optical demultiplexing and multiplexing units to demultiplex and multiplex, respectively, on a wavelength basis, light that is inputted to be outputted (pg. 1, lines 22-24) and an optical switch as recited above (fig. 13b).

However, AAPA fails to specifically disclose non-blocking optical matrix switches and the connection of the auxiliary output ports of the first optical matrix switch to the input ports of the third optical matrix switch, the connection of the output ports of the second optical matrix switch to the auxiliary input ports of the third optical matrix switch, the connection of the output ports of the first optical matrix switch to the auxiliary input ports of the fourth optical matrix switch, and the connection of the auxiliary output ports of the second optical matrix switch to the input ports of the fourth optical matrix switch.

Kashima discloses an optical cross-connect apparatus where switches are crossed for the expansion of input and output (fig. 1).

Okuyama discloses an optical cross-connect apparatus where switches are non-blocking (fig. 5a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have configured the connection of the auxiliary output ports of the first optical matrix switch to the input ports of the third optical matrix switch, the

connection of the output ports of the second optical matrix switch to the auxiliary input ports of the third optical matrix switch, the connection of the output ports of the first optical matrix switch to the auxiliary input ports of the fourth optical matrix switch, and the connection of the auxiliary output ports of the second optical matrix switch to the input ports of the fourth optical matrix switch since one would be motivated to reduce signal loss (Kashima, col. 1, lines 66-67. In addition, one skilled in the art fully acknowledges that the essence of cross connecting switches is to increase the maximum number of possible combinations of switching elements, ultimately shortening the switching response time (Kashima, col. 1, lines 24-26) to expand the combination of inputs and outputs referenced in Kashima. Furthermore, by including non-blocking optical matrix switches, one could also produce a combination with hardly any crosstalk (Okuyama, col. 6, lines 38-55).

9. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Kashima and Okuyama in further view of Shimomura et al. (U.S. Patent No. 6,347,168, from hereinafter "Shimomura").

AAPA and Kashima disclose the optical switch as recited above. However, the references fail to specifically disclose optical switches that are cross-bar optical matrix switches and switching elements that are semiconductor optical switches.

Shimomura discloses an optical switch system with optical switches that are cross-bar optical matrix switches having switching elements that are semiconductor optical switches (col.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used cross-bar optical matrix switches with switching elements that are semiconductor optical switches since one would be motivated by its smaller size, flexibility of use, and basic switching function (col. 1, lines 13-36). Its basic function of converting signals within a node minimizes communication costs (col. 1,lines 13-24).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 703-305-7242. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703-305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

gw
October 29, 2003

T. Chowdhury
Primary Examiner